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According to the Digital Television Transition and Public Safety Act of 2005, broadcasters across the United States must complete their switch from analog to digital video in 2009, rendering millions of television sets obsolete. Viewers will be required to purchase converter boxes in order to view the new high-definition (HD) signals. In addition to these behind-the-scenes changes to transmission standards, consumers will notice major differences on their television screens. The aspect ratio of the televised image will change from 4:3, the shape of a normal television, to 16:9, which looks more like a movie screen. Moreover, the resolution will improve dramatically from what was effectively 512 x 400 pixels (Brain 2001) to 1920 x 1080 pixels (Beaver Installations 2007). This means that even if you purchase a converter for your old television, the television still won't display the new HD signals very well.

But while old televisions do not support HD signals very well, they do come very close to the video standards in effect at YouTube where the typical video conforms to the 4:3 aspect ratio and the resolution is at least 320 x 240 (and can be as high as 640 x 480). It must have occurred to the executives at Google by now that the provision of a small and inexpensive appliance connecting soon-to-be obsolete televisions with the home computer could revolutionize the act of watching video.

After all, YouTube has already revolutionized the Internet. Founded in 2005 by three former PayPal employees, Chad Hurley, Steve Chen, and Jawed Karim, YouTube has grown in only a few short years to become the most popular site on the Web. A year after its creation, YouTube was serving 2.5 billion videos a month (Reuters 2006a). At the end of 2006, it was purchased by Google for $1.65 billion (Reuters 2006b), and in January 2008, almost 79 million viewers watched more than three billion user-posted videos on YouTube (Yen 2008).

Just as the appearance of the Web browser in 1994 marked the transition from the text Internet to the visual Internet, the creation of YouTube in 2005 marked the transition from the static Internet to the dynamic Internet. What made these transitions possible was the adoption of generally ubiquitous media formats. For the Web in 1994, those formats were GIF and JPEG; widely available viewers such as LView, "a shareware Gif/Jpeg viewer/editor that works well with Mosaic" (Graham n.d., “LView Pro," ¶2), could be added to Web browsers to embed these images in Web pages. For Web users in 2005, this format was the Macromedia Flash plug-in, which by then had been installed in 93% of all browsers (McAdams 2005). YouTube capitalized on the fact that the Flash viewer, which was designed for animations and games, was ideal for viewing video.

The rise of Flash video is relatively easy to explain. In a nutshell, as Tom Green notes, "bandwidth became cheap, users were demanding an easy install, and these same users regarded platform as irrelevant—video content should play equally as well on both the Mac and the PC platforms" (Green 2006a, “A short history of Flash video,” ¶8). Moreover, as Green explains, Flash provided the kind of access and flexibility that consumers of video require: "Debates about which format is best can stop. They are mostly irrelevant, because Web consumers are going to watch just as much quality content as they will watch garbage. They are simply demanding it be available anywhere at any time and on any machine and, at this moment in time, the Flash Player is really the only technology that fits the bill" (Green 2006b, “Forget about FLV,” ¶8).

The YouTube Web site itself reflects and expands upon the two major advantages of Flash video in its design. The first is that Flash allows Web users to post videos in a convenient format that is not constrained to platform-specific players or applications. YouTube further enhances this advantage by allowing users to upload their video in almost any format and have it converted into Flash video. This task can be

accomplished on the My Videos page, which allows users to upload videos using a simple Web-based form. For most users, each video is limited to a length of 10 minutes and a size of 1024 MB. Most ordinary video formats can be uploaded, or users can record directly from their Web camera using Flash video capture. Though the process may at first appear to be complex, it is in fact no more difficult than saving and selecting a file, and it becomes automatic after a few tries.

The second major advantage is that the ubiquity of the format ensures that users can always find something to watch. There is a wealth of content on YouTube; according to Wikipedia (2008), "As of April 9, 2008, a YouTube search returns about 83.4 million videos and 3.75 million user channels" (¶4). YouTube content has quickly become a part of Internet lore. Educators may well recall the last lecture of Randy Pausch, which, as of this writing, has been viewed almost two million times. Another major hit was the Evolution of Dance with 83 million views. YouTube has spawned celebrities, such as Lonelygirl15, and launched political careers, providing a venue for formal political content (as with Obama's "More Perfect Union" speech) as well as less formal political statements (for example, the Obama Girl video and "Yes We Can" by Will.I.Am).

This content is presented as an endless stream of videos available through designated channels created by members and sorted by popularity or via user-based communities such as the K12 Education Group. The search function is available—and effective—on all pages. Moreover, when any video is viewed, the site displays related videos along with a list of other videos uploaded by the same user, thereby encouraging browsing behavior. Live video, which is already supported by applications such as UStream, will be coming to YouTube at some point in 2008 (Schroeder 2008).

The educational use of a site like YouTube should be apparent. In fact, educational videos are widely popular within YouTube proper. As Jake Coyle (2007) notes, one of the site's top categories is called "Howto & DIY" (¶4). The sort of informal learning offered varies widely, from Robert Rodriguez's "10 minute cooking school" to videos that teach hair styling and often includes the kind of content students won't find in school, such as "How to kiss passionately."

However, YouTube comes with the risk that viewers will be exposed to inappropriate or offensive content. Thus, we see sites like TeacherTube, which provides the functionality of YouTube but with a specific mandate to keep content "safe." TeacherTube is tiny compared to YouTube, but nonetheless contains almost 20,000 videos and has seen some items attain as many as 500,000 views. TeacherTube has its own video celebrities, such as Mrs. Burk, who sings, in rap, about mathematics.

Educational administrators may also use Flash video to good effect. Using another online video hosting service, Blip, administrators in Scotland have created Connected Live to share information about teaching and learning. They also have a series of videos on Google Video. Touted by writers such as Ewan McIntosh (2007), such initiatives show that Web video can have an impact on teachers and students.

Skeptics claim that the impact of Web video will be no greater than the introduction of educational broadcasting or of the use of televisions in schools, and they may have a point. As Christopher Conway (2006) writes, "YouTube is not necessary for good teaching, in the same way that wheeling a VCR into the classroom is not necessary, or bringing in PowerPoint slide shows with images, or audio recordings" (¶14).

That said, Web video offers distinct advantages in the instructional setting. Never before has it been easier for educators to make their own videos, and for students, video technology has never been more accessible or more affordable. Moreover, new video sites transform learning not merely by providing a new channel for educational content but by creating new opportunities for students to express themselves and to see their own learning reflected back to them in a familiar environment. Student teachers, for example, see their work in a different light when their teaching practices are recorded and played back to them later; according to Towers (2007), "Students . . . need opportunities for learning . . . nuanced practice, and repeated viewings of classroom video and the associated materials of practice (e.g., student work and teacher planning notes and reflections relating to the videotaped session, etc.) can provide such opportunities" ("Video in Teacher

Education," ¶8).

As educators such as Michael Wesch have demonstrated, a site like YouTube can provide students with the opportunity to create powerful messages, present a vision of students today, and show how the Web is using us.

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